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An assessment of the Navy's Productive Unit Resourcing (PUR) system in use at Navy Field Contracting Activities

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AN ASSESSMENT OF THE NAVY'S PRODUCTIVE UNIT RESOURCING (PUR) SYSTEM IN USE AT NAVY FIELD CONTRACTING ACTIVITIES

by

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An Assessment of the Navy's Productive Unit Resourcing (PUR) System In Use At Navy Field Contracting Activities

by

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ABSTRACT

The primary objective of this thesis was to critically assess the Productive Unit Resourcing (PUR) system as it is outlined in NAVSUP INSTRUCTION 7000.21A and as it is being used at Navy Field Contracting Activities (NFCAs). The research was conducted by a review of current literature and exensive interviews with headquarters and field activity personnel. The research contains a review of PUR's predecessor system, the fixed workyear-cost funding methodology, an explanation of the PUR process and Procurement Cost Center algorithms, and summaries of the positive and negative impacts of PUR. Conclusions and recommendations are made concerning PUR's applicability to Navy Field Contracting Activities. Where specific problems were identified with either the process or algorithms, possible corrective actions are proposed.

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I. INTRODUCTION

A. GENERAL

Since the beginning of time, when man has been confronted with tasks to be accomplished, he has had to concern himself with the fact that he had limited resources with which to accomplish them. This situation has prompted man to continually seek out and, where necessary, develop better means of allocating and using scarce resources.

Often, man's solution to this resource dilemma has been to engineer a new mechanical device or process which, when implemented, frees up a limited resource and substitutes a more abundant resource in its place. Two well known examples of engineered solutions to constrained resource situations include Eli Whitney's cotton gin and Henry Ford's use of standardized parts and assembly line production in automobile manufacture [Ref. 1:pp. 736,566-568]. These engineered solutions freed up scarce manpower and material resources.

In addition to engineered solutions, management techniques and methodologies have also been developed to relieve constrained resource situations. Beginning with the work of Frederick Taylor and continuing with that of Henri Fayol, Elton Mayo and others, new management techniques designed to achieve gains in worker productivity have been introduced [Ref. 2:pp. 3-5]. By applying these new techniques, savings in scarce manpower and financial resources have been obtained.

Today, resources of all kinds including manpower, material and, in particular financial, remain scarce. Corporate executives in both the public and private sectors are feeling an ever increasing financial resource squeeze [Ref. 3:p. 8]. The Naval

Supply Systems Command (NAVSUP) is no exception. NAVSUP, in response to increasingly constrained financial resources, has developed and implemented a financial resource control and allocation system called Productive Unit Resourcing (PUR).

B. OBJECTIVES

The primary objective of this thesis is to critically assess the PUR system as it is outlined in NAVSUP INSTRUCTION 7000.21A and as it is being used at Navy Field Contracting Activities (NFCAs). A secondary objective of this research effort is to obtain a better understanding of the PUR system process and in particular, the application and use of the Procurement Cost Center algorithm. Finally, it is envisioned that the results of this assessment will be distributed and reviewed by appropriate NAVSUP Headquarters and field contracting personnel and that the PUR system will be modified to reflect recommendations resulting from the assessment.

C. RESEARCH QUESTIONS

In pursuit of the objectives, the following research question was posed: What have been the positive and negative impacts of the Navy's Productive Unit Resourcing (PUR) system as applied to the Procurement/Contracting Department of Navy Field Contracting Activities and how might the system be modified to improve its application?

In support of the primary question, the following secondary questions were established:

1. What is the PUR system and why was it developed and implemented?
2. What have been the positive impacts/results of PUR on NFCAs?
3. What have been the negative impacts/results of PUR on NFCAs?

4. How might the PUR algorithms be modified to improve PUR applicability at NFCAs?

5. How might the PUR process be modified to enhance PUR applicability at NFCAs?

D. RESEARCH METHODOLOGY

Research data was collected from two primary sources. Initially, the researcher conducted an extensive literature search. In order to familiarize the researcher with the subject area, custom bibliographies were obtained from the Defense Logistics Study Information Exchange (DLSIE). Key words/descriptors used to obtain bibliographies included: *Manpower Management, Manpower Requirements, Personnel Management, Personnel Resourcing, Resource Management, Productivity Measurement, Production and Budget Formulation.*

Literary sources examined included published and unpublished papers, periodicals, general reference texts and Government publications and reports. A complete list of literary sources used is contained in the List of References.

Secondly, research data applicable to the specific thesis research objectives and questions was collected via personal and telephone interviews. Fourteen persons at nine government activities were interviewed. Interviewees were selected such that both a headquarters and field perspective was obtained. All interviewees worked directly with PUR, either as headquarters/field activity functional managers or comptrollers responsible for activity budget preparation. Questions asked were open ended. Each question was designed to generate a discussion of any opinion that was expressed.

The researcher would like to acknowledge the tremendous cooperation and support given by those personnel interviewed. Their frank responses to the many

questions asked have greatly enhanced the validity of this study. A complete list of personnel interviewed is contained in Appendix A.

E. SCOPE OF STUDY

This study focuses on two specific areas. First, an examination of the generic PUR process is presented. Secondly, the construction and use of the Procurement Cost Center algorithm is reviewed. Other cost center algorithms such as Material and Inventory Control have been excluded from this study because they fall outside the researcher's area of interest.

In pursuit of information relative to the areas of study, the researcher has contacted as many Navy Field Contracting Activities as possible. The size, location and nature of business conducted by the various field contracting activities was of concern only to the extent that a balance among personnel interviewed was obtained. Appendix B contains a list of commands from which personnel were interviewed.

Recommendations made as a result of this study which call for modification of the PUR process and revision of the Procurement Cost Center algorithm are applicable to the entire NAVSUP field contracting system.

F. ORGANIZATION OF STUDY

This study consists of five chapters. Chapter I has outlined the objectives of the study in addition to providing comment on both the scope of the study and research methodology used.

Chapter II provides a historical perspective of PUR. Discussed are NAVSUP's pre-PUR resource allocation system, the rational for developing PUR, as well as an explanation of what PUR is and what it is supposed to accomplish.

Chapter III consists of two main sections. First, the PUR process is explained in detail. This is then followed by an in-depth explanation of the current Procurement Cost Center algorithm.

Chapter IV is a review, discussion and analysis of data collected during personnel interviews. Positive and negative impacts of PUR on field activities are discussed. Also, PUR process and Procurement Cost Center algorithm problems are examined and analyzed.

Chapter V summarizes the results of the research and presents conclusions and recommendations. The recommendations, if implemented by NAVSUP, will facilitate a better understanding of PUR as well as better application of the system to Navy Field Contracting Activities.

Appendices and a List of References are provided for information and to facilitate further research in this area.

II. BACKGROUND

A. PRE-PUR RESOURCE ALLOCATION

In order to better understand the impact of the PUR resourcing methodology, familiarity with its predecessor system must first be obtained. That is the purpose of this section.

The resourcing methodology that NAVSUP Headquarters used prior to PUR was the fixed workyear-cost funding methodology. Under this funding methodology, each field activity was allocated its financial resources for a fiscal year based on what it received the previous fiscal year, with appropriate adjustment for total funds available for allocation by headquarters. These allocated funds made up what was known as the field activity's "mission funding base" [Ref. 4]. During austere years, negative adjustments reflecting fewer available financial resources were made to the activities funding base. Conversely, when defense budgets were expanding, adjustments were generally positive and reflected growth.

Mission funding bases (levels) could be further augmented to reflect "above control" items [Ref. 4]. Above control items were those tasks being performed by the field activities which were not originally funded as part of the mission base and as such required the obtaining of additional funds. For example, a new initiative directed by headquarters requiring the shrink wrapping of all material pallets at Naval Supply Centers after promulgation of their base funding levels, is considered an above control item. Twice each year NAVSUP field activities would submit funding requests to headquarters for their above control requirements. Each funding request detailed exactly what was being done above control, why it was being done

and how much it was expected to cost. Requests were reviewed by the appropriate NAVSUP headquarters functional manager who either recommended approval or disapproval to the NAVSUP Comptroller (NAVSUP-01). If funds were available and the Comptroller concurred in the recommendation, funds were approved and added to the requesting activities mission funding base.

The mission funding base, plus approved above control requests, comprised all available funds for the field activity. From these resources activities were expected to meet all expenses (less those covered by direct customer reimbursement), including payroll, materials and physical plant. Requests to cover normal operating shortfalls were made directly to NAVSUP headquarters and were reviewed for need and availability of funds in a manner similar to above control funding requests. Excess funds held by field activities were subject to NAVSUP recall and redistribution.

B. RATIONAL FOR DEVELOPING PUR

The rational for developing the PUR system finds its genesis in the major shortcoming of the fixed workyear-cost funding methodology. As previously discussed, when budgeting and allocating resources under the fixed workyear-cost funding methodology, an activity's prior year budget formed the base upon which the current year budget was built. The base year budget was simply added to or subtracted from to get the current year budget. No attempt was made to build the current year budget from scratch, that is to "zero base" it [Ref. 4]. The fact that budgets were not zero based annually was seen by the NAVSUP Comptroller and functional managers as the major shortcoming of the fixed workyear-cost funding methodology, PUR was developed to correct that shortcoming.

PUR requires each activity to develop each year's budget from the ground up. As will be explained in more detail in Chapter III, field activities build their

budgets by forecasting annual workload (units to be produced) and then negotiate a rate (payment per unit worked) to be applied against each unit of work actually accomplished. The product of the forecasted workload units and negotiated rate is the planned activity budget. Thus, PUR was designed to eliminate the dependency that existed between a current and past activity budget, a dependency that was a key fixture of the fixed workyear-cost funding methodology.

C. WHAT IS PUR

As discussed in the introduction to this work, PUR was developed in mid-1985 as NAVSUP's reaction to the financial resource squeeze being felt within the United States Government and in particular the Department of Defense. PUR was to be NAVSUP's primary means of managing its allocated Operation and Maintenance, Navy (O & M,N) budget dollars for selected field activities. As developed, PUR provided financial resource control and a means of equitably distributing budget dollars by linking funding for NAVSUP field activities to actual output produced in the workplace [Ref. 5:p. 1].

PUR is governed by its own instruction (NAVSUP INSTRUCTION 7000.21A, PRODUCTIVE UNIT RESOURCING AT NAVAL SUPPLY SYSTEMS COMMAND (NAVSUP) FIELD ACTIVITIES), which clearly defines the roles and responsibilities of headquarters personnel and also those of Naval Supply Systems Command (NAVSUP) field activity personnel governed by the instruction. The instruction also outlines procedures and defines key terms and concepts. Enclosure (3) of the instruction contains specific information peculiar to the Procurement Cost Center. This enclosure defines exactly what the Procurement Cost Center is, the functions this cost center provides, the rate determination process and the calculations of large and small purchase productive units. General PUR procedures, terms

and concepts as well as those specifically applicable to procurement will be discussed in detail in the following chapter.

D. PURPOSE OF PUR

As outlined in Morris [Ref. 6:p. 1], the NAVSUP developers of the PUR system identified five basic purposes or goals for the system. These purposes are:

- Providing headquarters with a better way to measure the workload-funding-productivity relationship.
- Providing headquarters with a decision and performance review process capable of:
  - Comparing activity performance to negotiated plan,
  - Improving NAVSUP credibility with higher headquarters, i.e., NAVCOMPT, during budget reviews,
  - Permitting NAVSUP functional managers, particularly NAVSUP-02 (Procurement/Contracting), to compare performance of cognizant field activities for the purpose of transferring workload.
- Providing headquarters a means of generating funding for the accomplishment of Strategic Plan initiatives.
- Providing field activities a means of identifying and rewarding employee performance.
- Providing field activities with a mechanism for funding workload increases without going through the process of requesting additional funds from headquarters.

It should be noted that the order of presentation of the above listed purposes does not in any way connote priority or relative importance of the particular purpose or goal. Each of these purposes will now be examined in detail.

1. The Workload-Funding-Productivity Relationship

Under the fixed workyear-cost funding method of allocating resources, NAVSUP had no means by which it could measure the relationship between workload, funding and productivity. Headquarters had no quantifiable way of answering questions such as: Assuming X productivity per worker and Y financial resources available to pay workers, how much work (output) can be accomplished? It was intended that PUR, by linking workload and funding through a unit-rate connection, would enable headquarters to answer quantifiably this question and other similar questions involving workload, funding and productivity.

2. Decision and Performance Review Process

PUR will enable headquarters to compare actual activity performance to previously submitted plans through the use of activity phasing plans, discussed in the next chapter. Then by comparison of actual results to plan, management decisions, e.g., shifting workloads between activities, could be accomplished. Under the fixed workyear-cost funding methodology, this was not possible. Additionally, because budgets under PUR are to be zero based each fiscal year, NAVSUP could better defend annual budget positions to higher authority by using each activities forecasted workload and negotiated rates as backup. Again, this was not possible under the prior resourcing methodology.

3. Funding Strategic Plan Initiatives

As developed, PUR would give headquarters a means by which it could generate funds for new or emerging Strategic Plan initiatives. (These initiatives

are headquarters conceived programs or projects intended to enhance the entire NAVSUP organization.) PUR would enable headquarters to capture (claim and use) a portion of the profits generated by field activities during the course of normal operations and to use these profits to fund these initiatives. Previously, headquarters had to expend management reserve funds or specifically designate funds to ensure financing of new and emerging initiatives.

4. Identifying and Rewarding Employee Performance

PUR, through its quantifiable nature, was also designed to facilitate the identification of employees performing in a superior manner, as well as providing command funds with which they could then reward deserving individuals. Employees who produced more than planned and did so at a cost less than planned, contributed to the activity's profitability. Profits, those remaining funds equaling the difference between planned and actual costs, could then be distributed to superior performers as a reward for a job well done. Under the fixed workyear-cost funding methodology superior employees were usually subjectively identified and rewards, if made, came from the activity's general operating funds.

5. Internal Mechanism for Funding Workload Increases

Under the fixed workyear-cost funding method of allocating resources, activities which experienced unexpected workload increases had to request additional operating funds from NAVSUP. As previously discussed, these requests were subject to review for need and availability of funds and may or may not have been approved. PUR was to eliminate such requests by enabling field activities to generate their own funds. Under PUR, activities would receive additional funds automatically in their quarterly allocations. The additional amount received would equal the product of the additional productive units produced times the lesser of the negotiated or actual cost rates.

E. SUMMARY

This chapter has provided necessary insight into the fixed workyear-cost funding methodology which resulted in the development of PUR. It also defined PUR, and as well as identified and discussed the purposes of PUR. The following chapter will explain the PUR process in detail and will also include an in-depth explanation of current Procurement Cost Center algorithms.

III. PUR PROCESS AND ALGORITHMS

A. GENERAL

As discussed in Chapter II, the PUR system and the operational responsibilities of those included in PUR are promulgated in NAVSUP INSTRUCTION 7000.21A. The instruction is applicable to the eight Naval Supply Centers (NSCs), Aviation Supply Office (ASO), Ships Parts Control Center (SPCC), Naval Publications and Forms Center (NPFC), Navy Regional Finance Center (Washington, D.C.) and finally, the four Naval Regional Contracting Centers (NRCCs). All other NAVSUP field activities receive separate guidance concerning budget development, review and execution.

NAVSUP INSTRUCTION 7000.21A contains the generic PUR process and four enclosures which detail each cost center. The enclosures define the cost centers and associated productive units, designate technical manager and cost center manager responsibilities and also include updated charts of accounts for use by field activities.

This chapter will examine the various responsibilities of NAVSUP and field activity personnel, the generic PUR process and finally, the specific details of the Procurement Cost Center.

B. RESPONSIBILITIES UNDER PUR

Overall management of field activity resources is the combined responsibility of the NAVSUP Comptroller (NAVSUP-01) and also that of the various Cost Center Managers within NAVSUP. In fulfilling his managerial duties, the Comptroller oversees system maintenance, including defining cost accounts and updating the PUR

instruction when required. The Comptroller also issues budget guidance covering both development and execution, conducts rate negotiations, and reviews forecasted workloads and estimates of activity overhead costs. Additionally, he monitors the status of field activity performance versus plan and initiates quarterly budget adjustments for each activity [Ref. 7:p. 7].

The Cost Center Manager (CCM) is a principal assistant to the Comptroller. As such, the CCM is responsible for the tracking of activity performance against plan, extrapolating workload, monitoring backlogs and analyzing any workload or cost variances that develop [Ref. 7:p. 7]. The CCM is assisted in his efforts by a technical manager assigned to each specific cost center.

The Technical Manager (TM) is an expert in a specific functional area, e.g., Automated Data Processing (ADP), Accounting, Physical Distribution, Fuel, Procurement, etc. As such, he evaluates productivity enhancements suggested by the field, reviews changes in policy utilizing cost-benefit analysis, tracks and assesses performance quality and finally, makes PUR related recommendations to the CCM concerning his cognizant functional area [Ref. 7:pp. 8].

Field activity personnel are responsible for implementing PUR as outlined in NAVSUP INSTRUCTION 7000.21A. The instruction says that the field activity must, " ... take the initiative to institute measures for productivity and cost reduction ... where ... the PUR system should be the key indicator of resource management effectiveness." Management personnel, to include first line supervisors and foremen, are responsible for work center performance, implementing and monitoring cost reduction measures under PUR and for productivity improvements of their respective functions [Ref. 7:p. 2].

C. THE PUR PROCESS

Irrespective of the field activity or the cost center within the activity being considered, a basic PUR process can be applied. That process consists of four basic steps. These steps are: (1) Rate Determination, (2) Performance Review, (3) Performance/Execution and, (4) Adjustment Calculation and Processing. Together these four steps form the PUR cycle through which an activity develops its budget, performs its mission and then refines its budget based on performance. Each of these steps will now be examined.

1. Rate Determination

The rate determination process is the means by which each activity, working with headquarters, determines what its productive unit rate for the year will be. The process starts after the NAVSUP Comptroller has received appropriate budget control guidance from NAVCOMPT. This normally occurs only after NAVCOMPT is confident that the Federal and Department of Defense budgets are firm and few other Congressional actions affecting these budgets will occur. This normally occurs during the mid-summer months, approximately four months prior to the start of the new fiscal year [Ref. 7:p. 2]. Once the NAVSUP Comptroller has received guidance from NAVCOMPT, he begins to estimate the amount of funds available for use by field activities. The Comptroller does this by subtracting all funds required for activities not governed by PUR from his total available resources, as well as those funds required for headquarters operations, special projects, transportation, etc. [Ref. 7:p. 3].

Simultaneously, NAVSUP field activities are developing individual business plans. Business plans consist of each activity's estimate of overhead costs, workload in terms of productive units and productive unit rates. NAVSUP policy dictates that the rate contained in an activity's business plan equal the actual rate

being experienced, with adjustments for anticipated changes due to pay raises, gains in efficiency or productivity, and so forth [Ref. 7:p. 3]. Business plans are submitted to headquarters where they are reviewed by functional and cost center managers and the NAVSUP Comptroller. Headquarters then makes a counter proposal based on availability of funds and subjective judgment as to the validity of the estimates provided from the field. Headquarters then offers the field activity the chance to rebutt. At this point in the rate determination process, verbal negotiations generally begin.

Interactive negotiations, conducted between the commanding officers of field activities and the NAVSUP Comptroller, are used to finalize each activity's productive unit rate. It is at this time that the activities try to support any unique circumstances that an activity faces which could cause abnormal productive unit rates to be experienced. These negotiations always occur in Washington, D.C. at headquarters. Normally, only the commanding officer of a field activity attends the negotiations, although occasionally, activity comptrollers are also present.

The conclusion of the rate determination process is marked by headquarters issuing each activity its Financial Operating Plan (FOP) letter. This letter outlines, by function, each activity's projected total productive units to be produced in the coming year and productive unit rate. These figures represent the outcome of the rate determination process. The next step in the PUR process is Performance Review.

2. Performance Review

Within 30 days of receipt of the FOP letter, each activity must submit to headquarters its Phasing Plan [Ref. 7:p. 4]. The Phasing Plan is central to this step in the PUR process. The plan breaks down each functional area (cost center) into monthly increments of anticipated workload and assigns that workload

a cost rate. It should be noted that NAVSUP recognizes that an activity's rate will fluctuate over the year as factors affecting the rate change, e.g., staff grade level. Consequently, individual monthly rates need not exactly match the negotiated yearly rate, however, the weighted average of the monthly rates must equal the negotiated yearly rate [Ref. 7:p. 5]. It is against the Phasing Plan that each activity's actual performance will be measured.

3. Performance/Execution

The CCM reviews each activity's performance against its previously submitted Phasing Plan on a monthly basis. Variances in units produced, as well as those variances in the rate, are analyzed for significance in magnitude and trend. Input for this analysis is provided by each activity in the form of a naval message report. Message reports are required no later than 15 days after the end of a month for all cost centers, except Procurement which must submit its report no later than 22 days after months end [Ref. 7:p. 5]. Deviations from plan in either number of productive units produced or the rate can result in adjustment to an activity's budget. The adjustment calculation and processing step is the final phase in the generic PUR process.

4. Adjustment Calculation and Processing

The adjustment calculation and processing step is the means by which NAVSUP adjusts each activity's budget throughout the fiscal year. As part of the monthly CCM review, profit/loss calculations are made for each cost center at each activity. While calculations are done monthly, actual budget adjustments occur quarterly. Quarterly adjustments reflect the cumulative activity performance over the prior three months. Profits to be paid out to the activity or moneys to be recaptured from the activity by NAVSUP are dependent on the number of productive units actually accomplished and the rate at which they are accomplished as

	ACTUAL PRODUCTIVE UNITS GENERATED	
	HIGHER [1]	LOWER [1]
HIGHER [1]	* Additional Units Paid for at Plan/Neg. Rate Rate	* Funds for Lapsed Units Recaptured at Plan/Neg. Rate
ACTUAL PRODUCTIVE UNIT RATE	* No Profit Sharing	* No Profit Sharing
	* Additional Units Paid at Actual Rate	* Funds for Lapsed Units Recaptured at Plan/Neg Rate
LOWER [1]	* Profit Sharing Based On Approved Ratio for Planned Units	* Profit Sharing Based on Approved Ratio for Actual Units

[1] Relative to Plan/Neg Level

Figure 3.1: PROFIT/LOSS SCENARIOS

compared to plan. Figure 1, reproduced from NAVSUP INSTRUCTION 7000.21A, graphically displays the various profit/loss scenarios that exist.

As discussed in Chapter II, the profit sharing feature of the PUR system enables activities to generate additional funds when they experience increased workload and to provide a pool of moneys with which to reward employees who have contributed positively to increased productivity and efficiency. Similarly, NAVSUP has a pool of funds with which it can fund other initiatives.

The four steps discussed above constitute the generic PUR process. The next section will examine the specific features of the Procurement Cost Center.

D. THE PROCUREMENT COST CENTER

NAVSUP INSTRUCTION 7000.21A defines the Procurement Cost Center as:

> The Procurement Cost Center will resource all O & M,N labor and non-labor costs incurred by an activity in providing procurement services. It will be funded on the basis of large and small purchase productive unit cost rates multiplied by projected workload. Additions and withdrawals will be based on actual quarterly completions.

The functions included in this cost center are large and small purchases, contract administration actions pertaining to purchases, and procurement overhead costs. Conceptually, the rate determination process employed in the Procurement Cost Center involves the accumulation of all procurement O & M,N labor and non-labor costs, separation of these costs into large and small purchase categories and then division of the category totals by respective productive unit totals. The end result is a dollar per unit rate. In actuality, rates are determined by application of a series of algorithms. Each algorithm will now be explained [Ref. 7:p. 27].

1. Procurement Overhead Costs

All costs experienced by NAVSUP field activities are recorded in cost accounts (C/A). These accounts are nothing more than general accounting ledger categories, assigned by headquarters, and maintained for field and headquarters management use. The cost accounts assigned to the Procurement Cost Center include the following:

Cost Distribution Category	*Cost Account (C/A)*
Large Purchase Buying	271A
Small Purchase Buying	271B
Contract Administration	271C
Purchase Administration	271D
Procurement Overhead	271E

Procurement overhead costs accumulated in cost account (C/A) 271E are not discretely identified with either large or small purchases and thus must in someway be allocated to these categories in order to facilitate proper costing of the procurement function. This is accomplished by allocating procurement overhead costs in accordance with the NAVSUP INSTRUCTION 7000.21A prorating algorithms.

a. Overhead Allocated to Large Purchase

Procurement overhead allocated to large purchase operations is determined by application of the following algorithm:

$$P = \text{PROCUREMENT OVERHEAD} = \frac{271A + 271C}{271A + 271B + 271C + 271D} \times 271E \tag{3.1}$$

where costs are distributed into the previously defined cost accounts.

b. Overhead Allocated to Small Purchase

Procurement overhead allocated to small purchase operations is determined by application of the following algorithm:

$$P = \text{PROCUREMENT OVERHEAD} = \frac{271B + 271D}{271A + 271B + 271C + 271D} \times 271E \tag{3.2}$$

Again, where the cost accounts are as previously defined.

2. Large Purchase Cost Per Productive Unit

Total large purchase cost per productive unit is determined by application of the following algorithm:

$$\text{COST PER PRODUCTIVE UNIT} = \frac{L + C + P}{A} \tag{3.3}$$

where:

L = Total large purchase O & M,N labor and non- labor recorded in C/A 271A.

C = Total contract administration O & M,N labor and non-labor recorded in C/A 271C.

P = Procurement overhead cost allocated to large purchase.

A = Total productive units as reported in the Procurement Management Reporting System (PMRS) report DF106.

The PMRS is a NAVSUP system through which all procurement actions are reported. Monthly, field activities categorize and total all completed purchase actions. They then report these totals to headquarters using either a DD350 (large purchase, greater than $ 25,000) report or a DD1057 (small purchase) report.

DF106, a computer program in PMRS, automatically calculates and displays large purchase productive units based on input from the field and application of a productive unit matrix.

The productive unit matrix classifies each large purchase action, e.g., Delivery Order, Sealed Bid, Definitized Basic Ordering Agreement (BOA), Negotiated Competitive Supply, etc., and assigns productive units to that action. The number of productive units assigned is based on the amount of work required to complete the action when compared to the basic delivery order. For example, NAVSUP has determined that the basic delivery order requires 13 man-hours to complete and is thus assigned one productive unit. They then estimate that a negotiated competitive supply contract less than $ 100,000 requires 39 man-hours to complete. This action is then assigned three productive units (i.e., 39/13 = 3). A complete large purchase productive unit matrix can be found in Appendix C.

3. Small Purchase Cost Per Productive Unit

Total small purchase cost per productive unit is calculated as follows:

$$\text{COST PER PRODUCTIVE UNIT} = \frac{S + C + P}{A} \tag{3.4}$$

where:

S = Total small purchase O & M,N labor and non-labor recorded in C/A 271B.

C = Total purchase administration O & M,N labor and non-labor recorded in C/A 271D.

P = Procurement overhead cost allocated to small purchase.

A = Total small purchase productive units.

Total small purchase productive units are calculated from each activity's monthly DFPUR57 report. The DFPUR57 report is a summary report of each activity's small purchase productivity as reported by DD1057 inputs. Added to or subtracted from DFPUR57 reported productive units are NAVSUP calculated

quarterly bonus units. These units are added or subtracted from the field activity total depending upon whether the activity's ratio of procurement requests to actions completed for the quarter has increased or decreased as compared to previous quarters [Ref. 7:p. 30].

E. SUMMARY

This chapter has detailed the generic PUR process. It has also defined and then explained the specific details of the Procurement Cost Center. The next chapter will examine the positive and negative impacts of PUR as well as examine and analyze problems with the PUR process and the Procurement Cost Center algorithms.

IV. POSITIVE AND NEGATIVE IMPACTS - PROCESS AND ALGORITHM PROBLEMS AND SOLUTIONS

A. GENERAL

The previous three chapters have defined PUR, explained the PUR process and Procurement Cost Center algorithms, and have provided the reader with an understanding of PUR's predecessor system, the fixed workyear-cost funding methodology. With this as a foundation, it is now possible to examine the positive and negative impacts of the PUR process. Also, problems with the PUR process and Procurement Cost Center algorithms can now be understood. This chapter will address two specific areas. First, PUR's impact on user activities will be discussed. This will be followed by an examination of the problems associated with the PUR process and Procurement Cost Center algorithms. As each problem is examined, a possible solution, or a means by which the process or algorithms can assist in problem resolution at field contracting activities will be presented.

B. POSITIVE IMPACTS

In order to determine the positive impacts or benefits of PUR, each person interviewed was asked the following question: From his or her perspective (field activity or headquarters), what, if any, have been the benefits or positive impacts of PUR? All persons interviewed were able to cite at least one benefit or positive impact resulting from PUR. The following is a summary of the major benefits reported by the interviewees.

- PUR is quantifiable,
- PUR enables the user to examine operations from a business perspective,
- PUR provides a common unit of measurement for all activities,
- PUR enables field activities to generate and use profits,
- PUR clearly defines employee responsibilities,
- PUR can be used as an employee incentive device.

Each of the above listed benefits will now be examined in greater detail.

1. Quantifiable

The quantifiable nature of PUR was described as a benefit by seven of the fourteen persons interviewed. Interviewees explained that because PUR has as its foundation unit rates, counts of workload completed, etc., that activities are better able to manage workload variations. For example, the activities can quantifiably justify staffing requirements, overtime requests, material and equipment requirements, and so forth. Additionally, activities can now analyze workload and production trends with a greater detail than was ever possible in the past. Under PUR, quantifiable evidence can now be presented and used, where previously, subjective opinion was the norm.

2. Examine Operations From a Business Perspective

Five interviewees noted that PUR now forces field activities to examine their operations from a business perspective. As one interviewee put it, " ...(PUR) has made both military and civilian managers pay attention to the efficiencies of their operation ... now, (as in) retail operations you must be attuned to the bottom line, making the system pay." [Ref. 8]

Under PUR, activities can no longer focus solely on completing the mission at all cost. Cost is now a very important consideration. From both a field and headquarters perspective, field activities that operate profitably and still complete the mission are more desirable than those activities that complete the mission, but do so at higher cost. For this reason, having the ability to examine operations from a business perspective is a definite benefit at the headquarters level.

3. Common Unit of Measurement

Having common units of measurement with which all field activities gauge workload and productivity was seen as a benefit by virtually all the field personnel interviewed, as well as those at headquarters. Prior to PUR, field activities all measured anticipated workload, work in process, and work completed, differently. Prior to PUR, NAVSUP had never issued definitive guidance and allowed significant deviation with regard to the way activities measured performance. PUR introduced commonalty. Under PUR, activities could now be compared on an even basis as to workload, costs, and productivity. Backlogs could now be compared from one activity to the next. True comparisons could be made. Additionally, shifts in workload could now be contemplated by headquarters.

4. Field Activities Generate and Use Profits

As was discussed in Chapter II, the designers of PUR envisioned a system that would provide field activities a mechanism with which they could internally fund workload increases. PUR, through its profit sharing mechanism, makes this a reality. When coupled with NAVSUP's willingness to let each individual activity freely use internally generated profits, this PUR feature becomes a readily identified benefit of the system. Time and money are saved since activities no longer need to request additional funds from headquarters as additional funds are automatically provided in the quarterly budget adjustment. Also, because headquarters allows

activities flexibility with the use of profits, activities can make expenditures which otherwise would have been precluded. For example, activities may upgrade facilities by installing/remodeling lunchrooms, purchasing modular office furniture, installing desktop computers, and painting exterior buildings. Previously, funds for these expenses would have been requested from headquarters as a supplement to the activity's fixed budget. PUR allows the activities to generate funds and then to use these funds as necessary.

5. Defines Employee Responsibility

Four of the fourteen persons interviewed identified the fact that PUR clearly defines each employees responsibility under the system as a benefit. As was noted by one interviewee, activities can, through the use of PUR phasing plans, break down required output to the division, branch, and even the individual buyer [Ref. 9]. Additionally, because PUR is quantifiable, i.e., each action is assigned a specific number of productive units, activities can readily assign and gauge individual performance against predetermined performance goals. Employee performance standards can be written based on PUR productivity goals [Ref. 10].

6. Employee Incentive Device

Coupling the fact that PUR clearly defines employee responsibilities and the fact that PUR gives each command the flexibility to use profits as they see fit, an employee incentive device has resulted. Employees are told up front exactly what is expected of them. If they exceed their assigned goals and the command shows a profit, the employee is rewarded with a share of the profits. As was noted in Chapter II, this was one of the original purposes of PUR and in fact, at least two commands have used a portion of their profits for this purpose [Ref. 11]. This was recognized as a benefit of the system by five interviewees.

In summary, PUR has some very readily identifiable benefits. These benefits are such that they help both management and employees who work under PUR. The next section will examine the negative impacts of the PUR process.

C. NEGATIVE IMPACTS

Each interviewee was asked the following question: What were the negative impacts of PUR? As was the case with the benefits or positive impacts, all interviewees could cite at least one negative impact resulting from PUR. The interviewee's responses fell into two general categories: 1) negative impacts resulted in uncertainty with respect to the overall operation of the field activity, and 2) negative impacts, or more specifically problems, with the process or algorithms. This section will address those impacts which have resulted in uncertainty. The following sections will address the specific problems of the process and Procurement Cost Center algorithms.

1. Impacts Resulting in Uncertainty

The two common negative impacts (situations) that resulted in uncertainty with respect to the overall operation of the field activity are, first, inconsistency of PUR payouts, and secondly, PUR's total emphasis on quantity of output produced. Each of these situations will now be discussed.

a. Inconsistency of PUR Payouts

Several interviewees relayed to the researcher their concerns with respect to the inconsistent manner with which headquarters makes payouts under the PUR system [Refs. 4, 8, 10, 11]. Concerns generally revolved around the funding uncertainty that resulted from headquarter's inconsistency in making payouts. Concerns were the greatest when, as was the case in FY86, 87, and 88, no fourth quarter payouts were made to any field activity [Ref. 11]. (It should be noted that

no payouts were made the last two quarters of FY88. In effect PUR was suspended by headquarters during this entire period.) The feelings of the field activities regarding this issue are best illustrated by the following quote obtained from a field activity comptroller.

> NAVSUP has been consistent in not giving payouts in the last quarter ... we still go through the motions, make the reports, but there is no benefit other than we are keeping track. If we are going to have the program, then we should implement the program. If they (NAVSUP) are not going to make the program work the way it was intended, plus and minus as far as money, then we can do other things than (just) keep track of how many points we can generate. [Ref. 11]

As was noted in previous chapters, the ability of field activities to generate and then use profits is central to the proper functioning of the PUR system. Because PUR payouts are being made irregularly, field activity commanders are uncertain with respect to their ability to fund their activity, and as a result, they are severely constrained in their ability to manage. For example, the hiring of new personnel, undertaking of additional workload, and the purchase of productivity enhancing office equipment, all might have to be put on hold until the field activity commander is certain that additional funds are forthcoming.

In summary, funding uncertainty resulting from inconsistent PUR payouts is viewed as a significant negative impact resulting directly from the PUR system.

b. Total Emphasis on Production

The main emphasis of the PUR system is production. This occurs because it is through increased production that activities obtain additional profit. Because of the system's heavy emphasis on production, quality of the output has become secondary. This situation is viewed by virtually all interviewees as a significant negative impact of the PUR system As one interviewee explained, "There is

a definite tendency (to push production) ... I do not know how to factor in quality ... it's too hard to work a PUR's payout into quality. Quality has to be checked by other indicators." [Ref. 12]

Another interviewee also clearly made the point when he said, " ... (the emphasis is to) get it (the contract) awarded. Get what the customer wants. Quality is secondary." [Ref. 13]

Because of the quantity emphasis, quality has become a secondary goal. In the push to get more and more out, short cuts are taken, less time is devoted to each action, and as a result mistakes are made. Evidence of quality decreases at field activities, specifically in the activity's Procurement Cost Centers, can be found in the Ellsworth Associates, Inc., (EAI), draft report on PUR. EAI noted a significant increase in the number of contract modifications being issued (as a percent of total actions) for 15 field activities studied during the years 1985-87, and after the activities implemented PUR [Ref. 5:pp. 15-25]. This increase in contract modifications far exceeded the corresponding increase in regular procurement actions being experienced and thus indicates a decrease in the quality of the original procurement action being produced by the activities.

To summarize, the two negative impacts which result in uncertainty with respect to the field activity's ability to operate are, the irregularity of PUR payouts, and PUR's heavy emphasis on quantity resulting in quality degradation. Responsibility for correction of these problems lies with NAVSUP headquarters. NAVSUP can ensure consistent payouts by reserving funds early in the year, i.e., during the rate negotiation phase of the PUR process. The NAVSUP Comptroller can fence funds for fourth quarter PUR payouts just as funds are set aside for non-PUR activities or strategic plan initiatives.

Addressing the quality issue is somewhat more difficult. NAVSUP must develop outside of PUR, a system of quality indicators. The current system measures quality through reports of Procurement/Administrative Lead Time (PALT), backlogs, etc. However, these measurements are not part of the PUR system. In addition, NAVSUP must ensure that Procurement Management Reviews (PMRs), and other inspecting organizations, review in depth the quality of the procurement actions being accomplished in the field.

The next two sections will address the problems associated with the PUR process and the Procurement Cost Center algorithms.

2. Process Problems

Each interviewee was asked to address changes he/she would like to see in the PUR process and why? The intent of this question was to draw from the interviewees areas they viewed as problematic within the current PUR system. Responses to this question were varied, however, there was a general consensus on a number of points. Areas in which a majority of interviewees agreed included: forecasting workload under PUR, rate negotiations, availability of Management Information Systems (MIS) to support PUR, staffing under the system, and finally, susceptibility of the system to "gaming". These areas will now be addressed individually.

a. Forecasting Workload Under PUR

Nine of the fourteen persons interviewed indicated that accurately forecasting workload under PUR was a significant problem. Under the PUR system, field activities receive funds from headquarters based on an estimate that may not come to fruition. This forecast of funds amounts to the product of the number of units to be produced times the negotiated rate. When forecasts of workload are significantly different from actual workload being experienced, activity budgets fluctuate. Because of fluctuating budgets, management becomes constrained. As

is experienced with inconsistent PURs payouts, discussed in the previous section, fluctuating budgets lead to management uncertainty.

The ability of the field activities to forecast their workload is dependent on a number of factors. The primary factor is the reliability of the information received from the field activity customers. For example, virtually all the field procurement activities request input from their major customers regarding the number, type, and estimated dollar amount of procurements to be processed in the upcoming year. When the input received is accurate, the field activity has little problem assigned personnel to complete the work. However, when customers of the field activities submit bad input, possibly due to funding uncertainties at their own activity, the field contracting activity can experience significant problems. Examples include, extra personnel being recruited in anticipation of increased workload, or a reorganization being initiated to facilitate better processing of the new work. This results in the activity having to fund unnecessary personnel, or possibly, having to live with less than an optimal organizational structure. Other factors affecting the ability of field activities to accurately forecast workload include, the amount of funds being held in reserve by various customers, unanticipated fleet operations, and even fluctuating foreign currency exchange rates [Ref. 10].

Correcting an activity's inability to accurately forecast is both a headquarters and activity function. Headquarters can provide field activities with a frame of reference with regard to anticipated workload. They can give the field historical workload summaries by activity and by groups of similar activities. The field activity itself can develop its own historical workload data base, as well as instituting a program of formal personal contacts with each of its major customers. Working together with the customer, the field activity can better ensure the accuracy of its workload projections.

b. Rate Negotiations

As was addressed in Chapter III, verbal negotiations are used to finalize each activity's productive unit rate. Normally, negotiations are attended by only field activity commanding officers and the NAVSUP Comptroller and possibly some NAVSUP support personnel (cost/functional managers). Activity functional managers, e.g., Director, Procurement Department, do not attend. The absence of field activity functional managers at rate negotiations is viewed as a problem with the process. As one interviewee noted,

> ...rates are not negotiated between the functional sponsor, NAVSUP-02, and us (the procurement shop), they are negotiated between NAVSUP-01 and our Comptroller ...rates are becoming more of what can we afford rather than what does it cost. If we are serious about having this cost measurement system and we know what is costs (to do the work), it does not serve any purpose to ignore the functional manager and just let the comptroller's whack out dollars. [Ref. 14]

Field activity functional managers believe that in order to make PUR work as it was intended, they must actively participate in rate negotiations. They believe that their expertise in these areas make them the most qualified to discuss the costs of the particular function. It is believed that commanding officers and comptrollers may be willing to sacrifice one particular area in order to gain a better position in another. Therefore, field activity functional mangers believe they should negotiate their own rates and once rates are agreed upon, involve the comptrollers.

NAVSUP, in its effort to improve the operation of the PUR process, could bring into the rate negotiation process the field activity functional managers. The comptrollers could still make the decisions. However, with the functional managers in attendance, irresponsible actions could be identified early and lobbied against.

c. Management Information Systems (MIS)

Management Information Systems (MIS) used at field contracting activities were viewed as inadequate with respect to PUR. This was particularly true in the large purchase area (greater than $ 25,000).

As discussed in the previous chapter, large purchase actions are reported to headquarters via DD350 reports. Headquarters, using the PMRS DF106 computer program, validates these actions and calculates the number of productive units to be credited to the field activity. The preparation and transmission of reports and the running of this program takes time and resources. It is common for field activities to not know how many large purchase productive units they produced in a month until well into the following month. This fact is simply due to a lack of automation and over-reliance on manual data gathering and calculation. This lack of management information constrains managements ability to manage. It can result in the activity constantly having to play catch-up. For example, if the activity produced less than its phasing plan called for and it does not discover this fact until well into the following month, immediate corrective action may be necessary. Possibly because the corrective action was initiated late, the activity may never correct the problem.

This lack of management flexibility has prompted many activities to develop their own MIS system. The systems being developed provide more timely information and thus facilitate prompt corrective action when required. Unfortunately, no commonalty exists between the individual field activity systems. NAVSUP could help by examining the best of these field systems and, as they have done with other systems, export it to all other field activities.

d. Staffing Under PUR

Inherent in PUR is the assumption that field activities can rapidly expand or contract their workforce as required by a fluctuating workload. While this may be true in cost centers such as Inventory Control and Warehousing, managers of the Procurement Cost Center believe this to be an invalid assumption.

The nature of the work done within a field activity's Procurement Cost Center, particularly large purchase acquisitions, is very complex and involves a limited amount of repetitive work. Additionally, the work is strictly governed by a myriad of complex laws and regulations. As a result, personnel hired to perform this work require extensive amounts of training. Often, it takes several years for a GS-1102, Procurement Specialist, to become proficient in all aspects of the job for which he was hired [Ref. 10]. Temporary workers and intermittents cannot be expected to satisfactorily complete the work. Also, activities find that it is virtually impossible to hire a previously trained procurement specialist. This is particularly true at activities located in high cost-of-living areas [Ref. 8]. In summary, the nature of the job is such that it is not conducive to a rapid expansion of the work force.

Another staffing related problem inherent with the PUR process is the possibility of a command entering a personnel "death spiral". This a situation where, because an activity fails to produce as planned, it receives less funds than it budgeted for a particular quarter. As a result of receiving less funds, it is forced to reduce its staffing through retirements or other attritions. Because it then has fewer productive workers, it again produces less than originally planned, which leads to further budget cuts. Theoretically, the cycle could continue until the activity no

longer has the funds or personnel to continue to operate [Ref. 15]. No interviewees reported that their commands were in this situation, although all agreed that without careful management, the "death spiral" was a very real possibility.

Correcting staffing problems will be very difficult. Possible remedies include increasing the grade levels of the workforce with the intent of increasing the pool of possible workforce candidates, and where possible, making maximum use of creative staffing, e.g., job sharing.

e. PUR Gaming

The gaming or manipulating of PUR productive units was viewed as a problem by all interviewees. Gaming was viewed as a way to circumvent the PUR process. It was seen as a way to ensure achievement of planned productive units and thus, a means of guaranteeing profits.

Gaming productive units is a relatively simple process. For example, as a command approaches the end of a month, it informally counts the number of productive units completed to date. If it finds itself behind plan, it can simply redirect its effort toward simpler and faster types of actions, which will enable it to rapidly boost its completed productive unit count. An example of this type of gaming would include, the shifting of production emphasis away from time consuming negotiated competitive supply acquisitions to more easily completed delivery order type acquisitions. While delivery orders receive less PUR units than negotiated supply acquisitions, units lost can be more than made up in volume. Another example of gaming involves the breaking down of large contracts, e.g., $ 50,000 Household Good contracts, into lesser value contracts with the intent of receiving multiple PUR units (since units are based on number of contracts awarded).

Whatever the form, gaming, neutralizes PUR. It invalidates PURs' profit/loss mechanism and lessens the credibility of activity comparisons made under PUR.

Gaming will not be eliminated. It can, however, be controlled by careful analysis of report inputs received from the field. Coupling thorough analysis with possible reprimands of offenders should curb the desire to cheat.

The next section will address those problems more specifically associated with the Procurement Cost Center algorithms.

3. Algorithm Problems

In order to identify the problems interviewees had with the Procurement Cost Center algorithms, each interviewee was asked, What changes in the Procurement Cost Center algorithms would he/she like to see made, and why? Responses to this question again varied, however, three predominate areas were noted. The areas noted most troublesome or problematic were: first, the limited range of matrix values; specifically, the exclusion of credit for contract administration actions. Second, the fact that only completed actions are counted when calculating productive units. Finally, the appropriateness of the 13 standard man-hour productive unit base. These areas will now be examined in detail.

a. Range of Matrix Values

Interviewees noted that the range of matrix values used in the procurement algorithms was incomplete. This was particularly true with respect to the contract administration function. Currently, PUR gives no credit to an activity for completing any contract administration type action, e.g., contract terminations. At many activities, depending on the type of procurement actions being completed, this type of work can account for a significant portion of the overall workload.

Activities are now funding contract administration work out of moneys received for other credited work, i.e., small purchase. It is believed that as the rates for the other work are squeezed, activities will cut contract administration with the intent of remaining within budget [Ref. 4]. Cutting contract administration can cause an activity to experience a decrease in quality. This situation appears to have, in fact, occurred. As was noted in the draft EAI report on PUR, there appears to be a direct relationship between the level of contract administration performed at an activity and the quality of output produced. With the implementation of PUR, EAI has noted a decrease in the ratio of hours spent in contract administration (as compared to total operations) and a simultaneous increase in contract modifications and correcting actions [Ref. 5:p. 29]. Thus, the conclusion follows that cutting contract administration adversely affects quality.

Another problem with the range of values contained in the matrix involves cancellation actions. Currently, no command receives credit for cancellations initiated by customer activities. The moneys spent on the procurement, i.e., wages, materials, etc., must be absorbed for work completed to date. No credit is given and no moneys are received for the work done. As one interviewee noted,

> ...it's frustrating. You go all the way through to time of award and the customer comes back and says, "I can't give you that extra money, you've got to cancel it." You've made all the effort, 99.9 percent has gone in there, and you do not get any credit. It does not show up as a PUR. [Ref.10]

Receiving no credit for canceled procurements not only deprives commands of PUR credit and therefore operating funds, but it also can penalize individual workers. Worker performance is gauged by PUR units produced. Under the current PUR structure, workers are penalized by not receiving credit for work

performed. A buyer may have expended significant amounts of time working a procurement, and then, because of reasons beyond the buyer's control, it is terminated.

Steps are already being taken to correct these problems. NAVSUP is developing plans to include cancellations in the algorithms for FY89. Also, it has under study the feasibility of modifying the PUR algorithms to provide credit for contract administration work.

b. Completed Actions

The PUR algorithms currently credit only those actions which field activities report as completed. Work in process (WIP), receives no credit. This situation, related to the range of the matrix problems previously discussed, is also viewed as a problem.

Many procurements, such as negotiated competitive supply contracts or negotiated sole source procurements, can involve months of work to complete. Often, many specific actions are required by law or regulation before the final documents can be signed and the procurement finalized. Also, changing circumstances, e.g., unexpected funding increases or decreases, negotiation stalemates, requirements changes, etc., can prolong the time it takes to formalize a contract. It is not uncommon, therefore, for a procurement to be initiated in one month or quarter only to have it finalized months or even quarters later. Because PUR does not recognize the procurement action in process, field activities must absorb the costs of WIP until the individual procurement is complete. When reported, the activity is then given PUR credit and depending on the total units completed during this time period, profits may be awarded or funds may be recaptured, depending on the plan. Activities view the burden of having to fund WIP as a significant problem of the current Procurement Cost Center algorithms.

This problem could be rectified by expanding the productive unit matrix. Major efforts, e.g., negotiated competitive supply contracts, could be broken down into component parts. It should be noted however, that to implement this expanded matrix, significantly more manual tracking and recording of work would have to be accomplished.

c. Standard Man-Hour Base

The large purchase PUR algorithm uses a NAVSUP specified standard productive unit base of 13 hours, which equates to completion of one delivery order. One delivery order is in turn assigned one productive unit. All other procurement actions are measured against this base. For example, NAVSUP estimates that it takes 39 man-hours to complete a negotiated competitive supply contract, less than $ 100,000. For this type of procurement, it assigns three productive units, (i.e., 39/13 = 3). All the contract types listed in the large purchase productive unit matrix, Appendix C, have been determined through this methodology.

Personnel interviewed at the various field activities question the appropriateness of the 13 hour standard. Differences in activity staffs, particularly grade levels, and differences in customer input into the purchase request, are cited as reasons why a system wide standard should not be used. Interviewees cited examples of situations where many more hours were required to complete a procurement than was allowed for by the standard, e.g., a sealed bid procurement which required months to complete vice the allowed 39 hours [Ref. 8]. Evidence does exist, however, that substantiates the 13 hour standard. EAI studies of the standard, conducted at 14 field contracting activities, indicates that a sample wide average number of hours required to complete a delivery order is 12.67, with a standard deviation of 1.63. Also, EAI determined that the average number of hours to complete one productive unit of work in all other categories of the large purchase matrix was 11.58 hours,

with a standard deviation of .88 [Ref. 5:p. 8]. This evidence would indicate the validity of the 13 hour standard.

Empirical evidence indicates that the standard man-hour base is not a problem. NAVSUP could, however, quell some of the remaining uncertainty by publishing the final EAI report validating the standard.

D. SUMMARY

This chapter has reviewed and discussed the positive and negative impacts of PUR. It has also, examined the problems inherent in the PUR process and those in the Procurement Cost Center algorithms. Possible solutions to the various problems have also been presented. The final chapter will summarize the results of the research as well as present conclusions and recommendations.

V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The Naval Supply Systems Command (NAVSUP) has, in response to an increasingly constrained financial resource environment, developed and implemented the Productive Unit Resourcing system (PUR). This zero based resource allocation system was designed to help both headquarters and field activity managers better measure workload-funding-productivity relationships, provide better means of making activity comparisons, and provide a methodology by which field activities and headquarters could generate additional operating funds.

This research has critically assessed the PUR system outlined in NAVSUP INSTRUCTION 7000.21A as it is being used at Navy Field Contracting Activities (NFCAs). The research has presented a review of the environment in which PUR was developed. It has also presented an in-depth examination of the PUR process and the Procurement Cost Center algorithms. Problems inherent in the process and algorithms were also examined. Research data was collected from two primary sources: 1) a review of current literature and 2) personal and telephone interviews with headquarters and field activity personnel.

This research has discovered both positive and negative impacts that the PUR system has had on NFCAs. Additionally, possible solutions to the negative impacts (problems) have been examined and offered as a means by which PUR can be made more applicable to field contracting activities.

B. CONCLUSIONS

This research effort has led to several conclusions regarding the PUR system.

- *Conclusion 1. The PUR system has positively impacted both headquarters and Navy Field Contracting Activities.*

Headquarters and field activities have benefited from PUR in that they now have a quantifiable system which enables them to better analyze current operations. In particular, PUR has forced management to examine their operations from a business perspective with an eye towards the "bottom line". Additionally, PUR has fostered commonalty. Now, all field activities are measuring and reporting productivity from a common base. Valid comparisons between activities are now possible. Finally, under PUR, activities can now generate and use profits as they feel is necessary. No longer must activities request funds from NAVSUP every time they wish to undertake a new project, upgrade facilities, or hire personnel.

- *Conclusion 2. The PUR system has had some negative impacts on Navy Field Contracting Activities.*

The negative impacts of the PUR system are of two general types. The first consists of those impacts which result in uncertainty with respect to the overall operation of the field activity. This category includes budget uncertainty resulting from inconsistent PUR payouts and uncertainty with respect to quality resulting from PUR's total emphasis on production (contracts awarded). The second type of negative impact relates directly to the problems inherent in the PUR process and Procurement Cost Center algorithms. Negative impacts of this type include uncertainty with respect to an activity's forecasted workload, concern over the validity of rates negotiated without functional manager input, distress over a lack of adequate

MIS support, staffing concerns, and concern over the system's susceptibility to gaming. Also, included in this category are concerns over the adequacy of the range of matrix values and uncertainty over the validity of the 13 hour standard man-hour base.

- *Conclusion 3. Both the PUR process and Procurement Cost Center algorithms require modification in order to make the system more applicable to Navy Field Contracting Activities.*

In its current form PUR fails to achieve many of its original purposes because field activities have been reluctant to support the system. To make PUR more applicable to Navy Field Contracting Activities and thus obtain field activity support for the system, PUR's negative impacts must be eliminated or reduced. This includes eliminating the uncertainties mentioned above, plus allowing functional manager input into the rate determination process and correcting all other process and algorithm problems.

C. RECOMMENDATIONS

- *Recommendation 1. NAVSUP eliminate all uncertainty with respect to inconsistent PUR payouts, particularly fourth quarter payouts.*

NAVSUP could either, by fencing funds early in the fiscal year or through temporary termination of PUR at the close of the third quarter of the fiscal year, eliminate the uncertainty field activities have regarding fourth quarter operating funds. By fencing funds early in the year, NAVSUP provides a signal to the field activities showing total commitment to PUR and thus eliminates some of the payout uncertainty. Alternatively, NAVSUP could terminate PUR at the end of the third quarter of the fiscal year and fund activities via a separate funding methodology, i.e., fixed level, during the fourth quarter. This too would improve the PUR process.

- *Recommendation 2. NAVSUP clarify its policy regarding quality of output produced under PUR and develop appropriate quality indices for publication in the PUR instruction.*

As discussed in Chapter IV, because of PUR's quantity emphasis, quality of output has become a secondary goal. NAVSUP must provide leadership in this area by instilling in the field activities a desire to produce output of the highest possible quality while still achieving productivity goals. NAVSUP must clearly state its policy with regard to quality, publish quality standards, and then monitor quality through appropriate monthly/quarterly reports and/or inspections and audits. Possible quality indices NAVSUP could initiate include the number of contract administration actions processed as a percent of total actions, number of customer complaints received per month/quarter/year, etc.

- *Recommendation 3. NAVSUP develop and make available to field activities a data base containing historical workload summaries for each buying activity and their major customers.*

NAVSUP can, by developing a historical workload data base, help field activities with workload projections. More accurate workload projections will in turn stabilize the process during budget execution.

- *Recommendation 4. NAVSUP encourage field activity functional managers to attend and provide input into rate negotiations discussions.*

The field activity functional managers are personnel who know best exactly what it costs to perform any particular function. NAVSUP should utilize their expertise when setting individual activity PUR rates.

- *Recommendation 5. NAVSUP should review the Management Information Systems (MIS) being used by field activity managers in conjunction with PUR. NAVSUP should pick the best of these systems and export it to all activities.*

The MIS currently being used in the field activities is a hodgepodge of individually developed and maintained systems. By standardizing the system, NAVSUP will attain management continuity and commonalty with respect to reports and statistics available to all field activity managers.

- *Recommendation 6. NAVSUP should issue a policy statement strictly prohibiting the gaming of PUR statistics.*

As discussed in Chapter IV, the gaming of PUR statistics, e.g., units completed, invalidates PUR's profit/loss mechanism and lessens the credibility of activity comparisons made under PUR. By issuing a strong policy statement against gaming, NAVSUP will lessen the temptation to cheat.

In addition, NAVSUP could lessen gaming by vigorously monitoring monthly activity reports. By noting and questioning irregularities, e.g., delivery orders in excess of the historical norm, NAVSUP would pressure activities into reporting valid PUR statistics.

- *Recommendation 7. NAVSUP should expand the range of matrix values to include credit for cancellation actions and provide credit for contract administration actions.*

Credit for cancellation actions should be provided since in many cases significant amounts of work are expended on these procurements which are ultimately canceled. If PUR is to accurately reflect the work actually done in an activity it must, therefore, provide credit to cancellation actions. Similarly, unless NAVSUP is

willing to risk severe quality degradations and lessening customer service support, contract administration actions must also receive credit under PUR.

- *Recommendation 8. NAVSUP should publish and distribute to all field activities the EAI report validating the 13 standard man-hour base.*

NAVSUP could quell some of the uncertainty that currently exists involving the validity of the standard man-hour base by publishing EAI's findings. The findings, while not absolutely conclusive, do provide evidence indicating the validity of the standard.

D. REVIEW OF RESEARCH QUESTIONS

In order to answer the research question, five secondary questions were established. A summarization response to each question, secondary and then primary, is now provided.

- *Secondary Question 1. What was the PUR system and why was it developed and implemented?*

Chapters II and III provided the response to this question. As was discussed, PUR is a resource allocation methodology. Central to this methodology is the "zero base" budget concept. It is because PUR is zero based that it replaced its predecessor system, the fixed workyear-cost funding methodology. As outlined in Chapter III, the PUR process consists of four basic steps: 1) Rate Determination, 2) Performance Review, 3) Performance/Execution and, 4) Adjustment Calculation and Processing.

- *Secondary Question 2. What have been the positive impacts/results of PUR on NFCAs?*

The research discovered six positive impacts resulting from PUR:

- PUR is quantifiable,
- PUR enables the user to examine operations from a business perspective,
- PUR provides a common unit of measurement for all activities,
- PUR enables field activities to generate and use profits,
- PUR clearly defines employee responsibilities,
- PUR can be used as an employee incentive device.

- *Secondary Question 3. What have been the negative impacts/results of PUR on NFCAs?*

The research discovered that the negative impacts of PUR fall into two general categories: 1) negative impacts resulting in uncertainty with respect to the overall operation of the field activity, and 2) negative impacts, or more specifically problems, with the process or algorithms. Impacts resulting in uncertainty included budget uncertainty resulting from PUR's total emphasis on quantity resulting in quality degradation. Process and algorithm problems include uncertainty with respect to an activity's forecasted workload, concern over the validity of negotiated rates, lack of adequate MIS support, staffing and gaming concerns, and finally, concern over the range of matrix values and adequacy of the standard man-hour base.

- *Secondary Question 4. How might the PUR algorithms be modified to improve PUR applicability at NFCAs?*

As was discussed in Chapter IV, the PUR algorithms could be improved by expanding the range of the matrix to include credit for cancellation actions and credit

for contract administration actions. Additionally, the matrix could break down large complex actions into component parts, thus, enabling activities to receive credit for work in process.

- *Secondary Question 5. How might the PUR process be modified to enhance PUR applicability at NFCAs?*

The researcher proposed a number of possible ways the process might be modified to enhance its applicability. Possible modifications include development and use of historical workload data bases to enhance forecasting, inclusion of field activity functional managers in the rate negotiation discussions, and implementation of a standard field activity Management Information System. Also, it was recommended that NAVSUP develop and implement a strict "gaming" policy.

- *Primary Research Question. What have been the positive and negative impacts of the Navy's Productive Unit Resourcing (PUR) system as applied to the Procurement/Contracting Department of Navy Field Contracting Activities and how might the system be modified to improve its application?*

Secondary questions taken in the aggregate provide the response to the primary research question. As this research has shown, both positive and negative impacts exist. Also, the research indicates a need for modification of both the process and Procurement Cost Center algorithms.

E. AREAS OF FURTHER RESEARCH

Due to the changing nature of the PUR system, and in light of the recommendations made in this study, it is recommended that a revaluation of PUR be conducted periodically over the next few years. Emphasis of further study should

include the development and implementation of the contract administration matrix values, evaluation of progress made in implementing a standard MIS system, and a review of the effectiveness of NAVSUP's efforts to stop gaming.

APPENDIX A

INTERVIEWEES

1. Burgess, A. E., LCDR, SC, USN
   Director, Purchase Division (Long Beach Detachment)
   Naval Supply Center
   San Diego, California
   2 September 1988

2. Evanko, M.
   Procurement Analyst
   Navy Ships Part Control Center
   Mechanicsburg, Pennsylvania
   6 September 1988

3. Foley, G. B., CDR, SC, USN
   Procurement Lead Time Project Officer
   Navy Ships Part Control Center
   Mechanicsburg, Pennsylvania
   24 August 1988

4. Gonick, T. J., CDR, SC, USN
   Director, Regional Contracting Department
   Naval Supply Center
   Oakland, California
   9 September 1988

5. Knight, C. L., LCDR, SC, USN
   Director, Purchase Division
   Naval Supply Center
   San Diego, California
   12 September 1988

6. McDowell, W.
   Deputy Director, Regional Contracting Department
   Naval Supply Center
   Charleston, South Carolina
   13 September 1988

7. McGinn, K.
Director of Contracts
Naval Regional Contracting Center
Washington, D.C.
22 August 1988

8. Morris, J. W.
Senior Program Analyst
Naval Supply Systems Command
Washington, D.C.
22 August 1988

9. Mullen, J. D., CAPT, SC, USN
Head, Procurement Directorate
Navy Aviation Supply Office
Philadelphia, Pennsylvania
23 August 1988

10. Opilla, M.
Supervisory Procurement Analyst
Navy Aviation Supply Office
Philadelphia, Pennsylvania
23 August 1988

11. Paulina, M. J.
Comptroller
Naval Regional Contracting Center
Philadelphia, Pennsylvania
8 September 1988

12. Small, C.
Procurement Management Analyst
Navy Aviation Supply Office
Philadelphia, Pennsylvania
23 August 1988

13. Stegemann, J. D.
Financial Manager - Comptroller
Naval Regional Contracting Center
San Diego, California
1 September 1988

14. Ward, T. L., LCDR, SC, USN
Deputy Director of Contracts
Naval Regional Contracting Center
Washington, D.C.
22 August 1988

APPENDIX B

COMMANDS VISITED/INTERVIEWED

1. INVENTORY CONTROL POINTS

- Navy Aviation Supply Office
  700 Robbins Avenue
  Philadelphia, Pennsylvania 19111-5098

- Navy Ships Parts Control Center
  5450 Carlisle Pike
  P.O. Box 2020
  Mechanicsburg, Pennsylvania 17055-0788

2. NAVAL SUPPLY CENTERS

- Naval Supply Center
  Charleston, South Carolina 29408-6300

- Naval Supply Center
  Oakland, California 94625-5000

- Naval Supply Center
  937 North Harbor Drive
  San Diego, California 92132-5044

3. REGIONAL CONTRACTING CENTERS

- Naval Regional Contracting Center
  U.S. Naval Base, Bldg. 600-1
  Philadelphia, Pennsylvania 19112-5082

- Naval Regional Contracting Center
  937 North Harbor Drive
  San Diego, California 92132-5044

- Naval Regional Contracting Center
  Washington Navy Yard
  Washington, D.C. 20374-5000

4. HEADQUARTERS - SYSTEMS COMMANDS

- Naval Supply Systems Command
  Naval Supply Systems Command Headquarters
  Washington, D.C. 20376-5000

APPENDIX C

LARGE PURCHASE PRODUCTIVE UNIT MATRIX

CONTRACT TYPE	STANDARD MAN-HOURS	PRODUCTIVE UNIT WEIGHTS
Delivery Orders / GSA / Other Agencies	13	1
Sealed Bids	39	3
Unpriced BOA Orders	13	1
Initial Placement of BOA's Contracts & IOTC's Less Than $25K	26	2
DEFINITIZED BOA ORDERS		
$25K to Less Than $100K	39	3
$100K to Less Than $500K	143	11
$500K to Less Than $1M	143	11
$1M to Less Than $10M	182	14
$10M and Greater	182	14
NEGOTIATED COMPETITIVE SUPPLY		
$25K to Less Than $100K	39	3
$100K to Less Than $500K	52	4
$500K to Less Than $1M	117	9
$1M to Less Than $10M	182	14
$10M and Greater	182	14
NEGOTIATED COMPETITIVE SERVICE CA RETAINED		
$25K to Less Than $100K	52	4
$100K to Less Than $500K	156	12
$500K to Less Than $1M	156	12
$1M to Less Than $10M	195	15
$10M and Greater	195	15

CONTRACT TYPE	STANDARD MAN-HOURS	PRODUCTIVE UNIT WEIGHTS
NEGOTIATED SOLE SOURCE / 8a / NONPROFIT / EDUCATION / UTILITIES		
$25K to Less Than $100K	52	4
$100K to Less Than $500K	156	12
$500K to Less Than $1M	156	12
$1M to Less Than $10M	195	15
$10M and Greater	195	15

NOTES: Productive units were calculated by dividing the standard man-hours for each contract type by the base productive unit standard man-hours (13).

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8. Interview between A. E. Burgess, Lieutenant Commander, SC, USN, Naval Supply Center, San Diego, California, and the author, 2 September 1988.
9. Telephone conversation between M. Evanko, Code 02012, Navy Ships Parts Control Center, Mechanicsburg, Pennsylvania, and the author, 6 September 1988.
10. Interview between T. J. Gonick, Commander, SC, USN, Naval Supply Center, Oakland, California, and the author, 9 September 1988.
11. Interview between J. D. Stegemann, Naval Regional Contracting Center, San Diego, California, and the author, 1 September 1988.
12. Interview between K. McGinn, Naval Regional Contracting Center, Washington, D.C., and the author, 22 August 1988.
13. Telephone conversation between W. McDowell, Code 200, Naval Supply Center, Charleston, South Carolina, and the author, 13 September 1988.
14. Interview between G. B. Foley, Commander, SC, USN, Navy Ships Parts Control Center, Mechanicsburg, Pennsylvania, and the author, 24 August 1988.
15. Interview between M. Opilla, Navy Aviation Supply Office, Philadelphia, Pennsylvania, and the author, 23 August 1988.

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